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COMMENTS OF THE LOCAL GOVERNMENT SUSTAINABLE ENERGY COALITION ON BASELINE ISSUES

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For LOCAL GOVERNMENT SUSTAINABLE ENERGY COALITION

I. INTRODUCTION

As directed by ALJ Edmister, the Local Government Sustainable Energy Coalition (LGSEC)[1] submits these informal comments on issues related to baseline measurements for energy efficiency. During the April 28th Baseline Workshop, Decision 14-10-046 was highlighted to guide the discussion on the current implications of alternative baselines. The ALJ requested that California Public Utilities Commission ("CPUC") Staff "collect data from stakeholders, program evaluation studies, and market studies relating to, variously:

- the volume of deferred retrofits;
- the ability of program administrators to target and accelerate such upgrades cost-effectively;
- and analyze how to create appropriate incentives so that the program does not substitute for actions users likely would have taken absent support for incentivized energy efficiency measures"[2]

These key questions are so complex that the energy efficiency community has participated in workshops, the baseline topic is reserved for Phase III of this proceeding, and comments will be collected through a stakeholder process. To comprehensively address the three core topics above, the LGSEC proposes the following threads which touch on and add to the five specific questions asked as a follow-up to the April 28th Baseline Workshop. The LGSEC would like to focus on the following implications of moving the baseline to actual conditions:

[1] The LGSEC is a statewide membership organization of cities, counties, associations and councils of government, special districts, and non-profit organizations that support government entities. Each of these organizations may have different views on elements of these comments, which were approved by the LGSEC's Board. A list of our members can be found at www.lgsec.org

[2] D.14-10-046

- Updated Energy Accounting Leads To A Better Market Understanding: Using the existing conditions will allow regulators, administrators, and implementers to better understand what energy efficiency (and Integrated Demand Side Management) market interventions will motivate real people operating real buildings.
- Existing Conditions Are Compatible With Outcome-Based Code: The use of existing conditions for an energy baseline will yield complimentary metrics for local governments implementing outcome and performance based code compliance initiatives.
- Measure Real and Reliable Savings Impacts: Measuring actual savings is the ideal method for the real and reliable accounting of avoided energy as well as long term energy procurement.

I. Updated Energy Accounting Leads To A Better Market Understanding

One central issue to note is the ALJ's closing remarks at the April 28th workshop, which focused on deferred retrofits and their related challenges. The questions aimed to determine who is 'sitting on retrofits' for a decade, how do we move these people to action, what are they doing, what are they not doing, and how do we measure this? The LGSEC would like to posit that the California Energy Commission's ("CEC") identification of the following market failure is perhaps the most significant root issue of deferred retrofits:

"Upgrade decision makers in the marketplace use shorter cost recovery terms than CEC uses in [Life Cycle Cost Analysis] LCCA."[3]

[3] Brook, Martha. *Role of Codes and Standards and Energy Procurement Planning in Determining Baseline.* CPUC Baseline Workshop. April 28, 2015. Slide 9.

A. Understanding Regulatory and Legislative Processes and Their Implications for Baseline

The CEC observation quoted above means that real people making decisions have a very different appetite for retrofits than what either Commission traditionally calculates for planning purposes (i.e., in CEC Codes and Standards Development as well as in the CPUC Potential and Goals Study). If there is a disconnect between these two – 1) the people making decisions about their buildings, and 2) the legislative and regulatory planning and procedures – it is natural to expect that not every person will be optimally influenced by ratepayer programs to 'pull the trigger' on a retrofit. Moreover, every decision maker – from Homeowners Associations, developers, commercial property owners, to local governments – each has a spectrum of payback, cash flow, first cost, etc. hurdles to clear when making that decision that is rooted in actual conditions. So while both Commissions have the obligations to uphold their regulatory and legislative roles in their rigorous planning activities, there is an additional opportunity to apply equal rigor to accurately characterizing the market.

If this disconnect above is indeed true, it would be extremely beneficial for all stakeholders to have an understanding of the 'hand-offs' between critical data pieces between Commissions. These handoffs focus on how the baseline and cost effectiveness are currently treated by regulatory and legislative processes – which contrasts what rational decision makers must face when hiring a contractor. The LGSEC understands that the Commissions have the responsibility to engage in the process described below; however, we recommend that an additional analysis occur to understand what real people face when deciding whether to retrofit a building. The result would be that the Commissions would have one benchmark for cost effectiveness based on oversight requirements (i.e., what we have today with Codes and

Standards CASE Studies[4] and the P&G Studies[5]); and the second analysis would yield a deeper understanding of the full costs and benefits of retrofits through a customer-focused lens. Then we can begin to answer questions and evaluate why retrofits are not happening and what change in market potential could be unlocked with alternative baselines or incentive structures.

The following is a simplified chain of how baseline and cost effectiveness issues relate to legislative and regulatory analysis. The assumed constraints in the legislative and regulatory analysis contrasts how the actual market evaluates retrofit options. The simplified process may be described as:

1. Codes and Standards are updated to become more stringent
2. Only C&S that are 'cost effective' are integrated into the code update
    a. 15-30 year time periods are used in the life cycle cost analysis
    b. Only the incremental costs between current code and future code are used in the calculations
    c. Neither of these typically reflect what real people in real buildings will consider when making a retrofit decision
3. The investor-owned utilities conduct CASE (Codes and Standards Enhancement) Studies that provide technical, market, and economic data supporting advocacy of new codes or standards[6] which do carry uncertainties[7]

[4] 2016 Title 24 Final CASE Reports for July 21, 2014, Staff Workshop on Proposed Energy Efficiency Measures for Residential Buildings
http://www.energy.ca.gov/title24/2016standards/prerulemaking/documents/2014-07-21_workshop/final_case_reports/

[5] Energy Efficiency Potential and Goals Studies
http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Energy+Efficiency+Goals+and+Potential+Studies.htm

[6] In the 2010-2012 California Statewide Codes and Standards Program Process Evaluation Final report: "Most observers considered [CASE Reports] them to be technically solid, but several industry

4. The CPUC Potential and Goals Study performed by Navigant Consulting builds on top of the CEC C&S updates, and the CASE Studies to determine what measures can cost-effectively be incentivized *above code*
5. Meanwhile real people in real buildings may be deferring retrofits and not pulling permits because acting may not be cost effective for them

A grounded understanding of this divergence in regulation vs. the market reality is important to effectively address trapped energy efficiency below the code baseline. Good data rather than anecdotes is difficult to produce for the Commission at this point because program data are collected for the investor-owned utility incentive programs, and not for code-compliance (under incentive programs); however, the LGSEC suggests that the Phase III efforts focus on creating a series of scenarios that re-model components of the process described above to reflect the expectations and assumptions of rational actors in our market and compare the potential savings and potential incentive levels against what has historically been calculated. A secondary effort that may have benefit in Phase III would be to determine how to perform an energy accounting that measures total on-bill savings, below-code savings, and above-code savings for every project that receives an incentive through a core program. And the below-code savings will be well documented and can be subtracted from the Statewide assumptions about C&S impact so that there is accuracy in the 'zero-sum accounting' that was also referenced in Jeanne Clinton's opening remarks at the April 28th workshop.

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stakeholders faulted them for not relying upon the most complete and accurate data. Obtaining the best quality data, however, was a challenge in several cases because of industry reluctance to make key data available. Some industry participants also considered the utilities and their consultants to have an inadequate understanding of the market in which the firms participated.

[7] Per the CEC presentation on April 24th, there are documented baseline issues in compliance rates and building turnover which appear in the CASE Reports

B. Understanding Baseline Implications and Decision Makers

California's ratepayer funded energy efficiency programs are understandably designed from the perspective and for the benefit of both utilities and regulators seeking to act for the benefit of ratepayers. Considerable expertise has been applied to the design of the accounting that underpins California's ratepayer incentive programs, but the focus has been on the benefit of ratepayers as a population, and the benefit of utilities in order to secure their participation, while minimizing free riders and total resource cost. When the potential for savings beyond code is plentiful, then there can be good alignment between the interests of the population of ratepayers and the interests of individual decision makers at facilities targeted for upgrades. However, as energy codes become more stringent, the gross savings potential above code diminishes, and the marginal cost of remaining savings potential above code increases. This diminishes the alignment between the interests of the individual decision maker and the underpinnings of how the CPUC manages the interests of the population of ratepayers.

To enhance the ability of the State's energy efficiency programs to motivate the market to take action, California's efficiency market actors should prioritize reduction in uncertainty for the decision maker. All of the CPUC frameworks underrepresent the impact of uncertainty on decision-making by energy efficiency customers:

- Decision makers in private sector facilities (building owners as well as tenants) systematically do not apply life cycle costing because of the tenuous nature of business and economic cycles, tenancy or ownership hold periods, and cyclical rebate budgets.
    - Life Cycle Costing ("LCC") is a valuable concept in code development, because a building will have a lifetime of impacts on the economy and environment.

- LCC is similarly valuable for long term institutional owners, whose institutions help limit uncertainty.
- However, individual decision makers (private sector building owners, tenants, and even elements of MUSH (municipal, universities, schools, hospitals) with limited resources or transitory management) have a short-term time horizon, and long-term assumptions such as Expected Useful Life and LCC are not applicable.

- Complexity devalues the value of any financial incentive, which reinforces short-term decision-making. Uncertainty about (1) dollar value of energy savings, (2) amount of incentive payment, and (3) portion of the project that qualifies for an incentive payment, all serve to heighten the perceived discount rate for future benefits and costs.
- Expected Useful Life is a working assumption upon which cost-effectiveness rests. However, useful life for a given measure is a probability distribution that is unique to the measure; manufacture, design, installation, and situation; and maintenance. Efficiency project customers make decisions implicitly on their judgment of the remaining useful life of a measure, which for any individual piece of installed equipment can be very far from the average. However, the efficacy of energy efficiency programs is hindered by complexity, so it would not make sense to develop a still more complex model to describe useful life and adjust for circumstance and perception.
- Using existing conditions as baseline reduces complexity *from the point of view of the party making the decision to implement an energy efficiency project*.

The divergence in interests has accelerated as California approaches its Zero Net Energy goals - so much so that it is essential to review the situation from the point of view of the individual decision maker (a ratepayer whom other ratepayers are attempting to motivate with incentives). The decision maker must make decisions based on expected utility; expected utility is the sum of the usefulness of possible outcomes multiplied by their probabilities. Given the considerable complexity of the accounting methods and intellectual infrastructure the CPUC manages, it's understandable that the CPUC has been implicitly treating decision maker motivation as a choice between the utility of only two outcomes: the total utility of completing a project with timely collection of applicable financial incentives and energy cost savings equivalent to the engineering estimate, vs. the utility of not executing the project (with no rebate and no energy cost savings). However, in the field, local governments have observed that the range of options considered by a given business or multifamily decision maker include but are not limited to:

- the evaluation of the probability that a rebate is paid;
- consideration of the time cost to understand the actions necessary to qualify for a rebate and to apply for the rebate;
- the probability that funds will remain available and that the contractor will supply and install the correct equipment to qualify;
- the ability of the installed system to realize savings per engineering estimates; and
- the ability for local government building officials to adequately apply the code to complex existing conditions given limited time for reviews and the competition for other health-life-safety aspects of a given retrofit's scope of work.

Each one of these considerations creates one or more potential outcomes that increase the complexity of the decision and reduce the expected utility of the retrofit.

We do not argue that CPUC should require portfolio-level, or measure-level, nor even project-level modeling of individual decision-making to the existing accounting framework. Rather, we recommend that the CPUC recognize that the existing framework is extraordinarily complex and is not suited for the transition to ZNE-approaching codes, nor for daily decision-making processes on energy retrofits; the existing complexity is inherently opaque to the decision makers we seek to motivate, and piling on further complexity to address this and myriad other issues would only serve to sap implementers' ability to utilize ratepayer funds to motivate retrofits.

II. Existing Conditions Are Compatible With Outcome Based Code

Energy outcome-based codes appeal to local governments because of their ability to capture existing conditions as well as provide a simplified process for evaluation that is based on performance in practice, not theoretical modeling or difficult to document engineering expectations. For example, key findings from the Bay Area Regional Energy Network ("BayREN") PROP report show that complexity with the building code results in progressively diminishing code compliance as a project progresses from plan check, to plan review, to field inspection.[8] The ability to incentivize and encourage actual building performance post-construction can be a way to improve compliance by simplifying the review and inspection process.

[8] *Permit Resource Opportunity Program Final Report*, the Bay Area Regional Energy Network, Codes & Standards Program, April 1, 2015, www.bayren.org/codes/prop-final-report

The use of existing conditions for an energy baseline will yield complimentary metrics for local governments working towards implementing outcome- and performance-based code compliance initiatives. There are many synergies between an existing conditions baseline and an outcome based code. When complying with an outcome-based code, or when pursuing a 'paid for performance' incentive, the existing conditions must be documented. Currently existing conditions are not generally required by either the energy code or for ratepayer incentives. If the CPUC baseline were to move to existing conditions, and if there was an outcome-based code compliance pathway, then performance-based incentive structures could be created that reflect actual conditions and actual people retrofitting buildings.

In the U.S. there are examples of this alignment between code and incentives. Seattle has accomplished this and described the innovative collaboration in an ACEEE Paper as follows:

"This voluntary, alternative pathway, in a departure from prescriptive and modeled-performance code paths, regulates whole building energy consumption by verifying actual building energy use against a specific energy use index (EUI) threshold. The framework is being aligned with utility incentives to encourage innovation and reward performance."[9]

This approach also aligns with the CEC AB758 Existing Buildings Energy Efficiency ("EBEE") Action Plan Guiding Principles[10] of "User Focused" and "Performance Driven." Especially called out in Goal 3, "Building Industry Delivers Innovation And Performance," there exist tools for added layers of safeguarding ratepayer investment. Such tools are designed to perform EM&V with smart meter data rather than requiring physical data loggers, sensors, and a visit to each site. More projects will potentially be cost-effectively monitored and a better understanding of savings persistence can be gained. Furthermore the CEC plan identifies

[9] Pinch, Cooper, O'Donnell, Cochrane Jonlin. *Driving Innovation, Rewarding Performance: Seattle's Next Generation Energy Codes and Utility Incentives.* ACEEE. Page 1. Accessed at http://aceee.org/files/proceedings/2014/data/papers/6-496.pdf . on May 19, 2015.
[10] CEC. AB758 Existing Building Energy Efficiency Action Plan. 2015. Page 22

initiatives for Streamlined Program Delivery, and Strategy 3.2.2[11] for Performance Based Incentives, which necessitate using existing conditions as baseline. The LGSEC recommends the CPUC investigate a parallel process to evaluate traditional core program incentive mechanisms alongside a theoretical evaluation of outcome-based incentives using actual program data. This could form the basis of a revised cost effectiveness study based on actual data, rather than the modeled assumptions that are seen in Codes and Standards Development as well as the Potential and Goals Study.

The mechanics of the outcome based incentive programs is described in ACEEE Papers, and as implemented in Seattle[12] involved setting an appropriate EUI baseline per building type. This is where CEUS data, tools such as the Energy Atlas, as well as protocols such as the CEC's Time Dependent Valuation ("TDV") can play a role in a harmonized approach that consolidates joint agency metrics and procedures. The International Code Council has created an approved methodology based on EUIs that demonstrates the framework for how the performance can be compared against a reference benchmark[13]. The LGSEC would further recommend the CPUC incorporate explicit metrics for grid impact as well as greenhouse gas emissions in this process. The incentive structure separated, by measure, payments that would be due upon construction completion that relied less on occupant behavior, and second, payments post-occupancy for verified energy savings for measures that depend more on occupant behavior such as domestic hot water demand and HVAC end uses, measured over a 12-month period. It is this kind of

[11] CEC. AB758 Existing Building Energy Efficiency Action Plan. 2015. Page 72
[12] Pinch, Cooper, O'Donnell, Cochrane Jonlin. *Driving Innovation, Rewarding Performance: Seattle's Next Generation Energy Codes and Utility Incentives.* ACEEE. Accessed at http://aceee.org/files/proceedings/2014/data/papers/6-496.pdf . on May 19, 2015
[13] ICC. GEW147-14 Section 612 Outcome-Based Pathway Requirements. http://www.iccsafe.org/wp-content/uploads/GEW147.pdf

innovation that the LGSEC recommends be initiated through a Baseline and Measured Performance Based workgroup across the Commissions, Public Agencies, and Stakeholders.

III. THE DATA WE HAVE

The LGSEC has sought program data to answer the original question in D.14-10-046. While we have provided some data below, we would appreciate the opportunity to work .with the CPUC to continue to refine our data sets and to collect additional relevant data

Table 1 – D.14-10-046 Questions Summary

ALJ Requested Topic	**Type of Additional Study Needed**	**Type of Data Available**
Volume of deferred retrofits	Updated saturation surveys and turnover based on primary data collection with special attention paid to EUL/RUL AMI analysis to overlay saturation and turnover studies	AMI Data Existing Saturation Surveys (PA's and LGs do not likely have this volume of data to supplant existing work) Building stock vintages with hotspot mapping for potential deferred retrofits
Ability of Program Administrators to target and accelerate upgrades cost effectively	• Control studies to measure program impact in areas with/without incentives • Pre/post program implementation data in a city/region • Pre/post permitting data in those same programs	• Permitting data rarely captures data in an electronic format that is easily compiled to conduct a study in the timeframe of this Phase of the proceeding
Analysis of appropriate incentives that do not substitute for actions that would have been taken anyways	• Parallel calculations on cost-effectiveness for actual conditions as well as for code baseline	• Recommended as Part of Phase III Study

IV. TERMINOLOGY

The terms *compliance* or *compliant building* can be characterized in a number of ways. The CPUC's Energy Division Evaluation Team views energy compliance as a target minimum: a building constructed to meet its energy budget (based on modeling of the prescriptive package) is considered to be fully compliant. A building that performs better than this minimum is also considered compliant. Conversely, a building that does not achieve compliance can be close to or far away from the point of compliance.

Under this definition of compliance, projects can and typically do exceed compliance, sometimes by a substantial margin. Projects can contain compliance errors and product substitutions and still be deemed compliant. This is largely because few buildings are designed to perform at the exact target energy budget; there is typically a margin above the target that accommodates errors and substitutions during construction.

Instead of viewing compliance as an absolute point on a scale, another way to view it is as a relative point on a spectrum. In this view, buildings can be seen as *more compliant* or *less compliant* rather than simply compliant or noncompliant.

The energy impact associated with discrepancies has the potential to be substantial (and quantifiable). Compliance with the inspection and review process, including submission of complete documentation, installation of required components, and proper testing of required functionality, may affect the building's energy performance.

The BayREN PROP report used the terminology "compliant" when referring to a building that meets minimum code requirements, regardless of whether errors are found. The terms *compliance margin* or *relative building performance* are also used to describe the relative change in building energy performance at different stages of review. The term *discrepancy*

characterizes errors with enforcement of California Building Energy Efficiency Standards that may or may not affect building performance or building compliance. The term *conformance* refers to adherence to required energy documentation and processes.

This terminology matters. As identified in the PROP report, only a small fraction of projects found during the 15 jurisdictional investigations were found to have error-free energy documentation at all stages of the BayREN's review.[14] Yet errors do not neatly correlate to *compliance* because the baseline (wither code minimum, above code, or below) is not consistent from project to project. Therefore, the way in which local governments view and enforce compliance with the energy code can be very different than how compliance is understood from a statewide regulatory perspective, especially when considering existing conditions of a building.

V. RESPONSE TO QUESTIONS

1. *The measure characterization list presented by CPUC staff— and included in the CPUC white paper presentation—identifies the measures that will be covered in the Baseline Analysis, and how they should be characterized. This is intended as a starting point for discussion analysis rather than a decision on the baseline.*
    a. *Is the measure characterization list complete, or are there additional types of measures that may have uncaptured energy efficiency savings below code or ISP?*
    b. *Are they (i.e. measure characterization list) characterized accurately? What changes do you propose?*

The LGSEC recommends a wholesale consistent approach, not piecemeal added complexity.

Examples:

- The poster child for ECMs that offer considerable promise of uncaptured energy savings potential are boilers. Boilers and large pieces of HVAC equipment are expensive to purchase and install due to design features unrelated to energy -- they

[14] See the PROP report, Figure 5, page 14. www.bayren.org/codes/prop-final-report

are often located in vaults, roofs, and hard to access locations. Therefore, there is not always a bright line to be drawn in the field between the most expensive line item in a project and the performance of the system. Differential incentive accounting methods for different ECMs within the same project would be difficult to implement and difficult for the customer/decision maker to understand.

- Lighting systems may appear to represent the opposite end of the spectrum. The up-front challenges of cost and installation access are not as daunting to a customer. However lighting controls upgrades and the configuration that is required to ensure they work properly entails significant costs that can far exceed either the cost or perceived marginal benefit of a simple retrofit.

2) *In your professional experience, what are the types of actions in the marketplace that lead to buildings/energy end uses failing to meet code or be upgraded to ISP, and what measures do not get adopted because of this? Please be specific and comprehensive, listing out all types of activities and correlated measures that you are aware of. Please identify the types of building that these experiences apply to, i.e., Class A, B or C commercial; public or private buildings, types of commercial activity, vintage of buildings, etc. For instance, what ways do contractors act to avoid "triggering code"?*

There are three different use cases that must be addressed separately:

Use Case 1: DEER EUL is not applicable because the commercial or multifamily decision maker has no particular intention or motivation to upgrade – i.e., don't fix it if it isn't broken.

This use case can apply to any type, scale, or use of building (commercial and multifamily, common area or tenant, and all classes of properties). If current owners or tenants accept the functionality of existing systems and do not anticipate renovation-triggering transactions, then a property (or system within an otherwise well managed

property) may continue operating indefinitely without being upgraded to meet code. The presence of such facilities is implicit in the CEC's basic description of the challenge of existing buildings: "With regard to existing buildings, more than half of California's 13 million residential buildings and more than 40 percent of commercial buildings were built before 1978, when the state first implemented the Building Energy Efficiency Standards."[15] If all components of existing buildings were systematically being periodically upgraded at approximately their DEER EUL, then the distinction between facilities built before and after 1978 would be meaningless. Nearly every measure in DEER has an EUL considerably less than the 37 years that have elapsed since the Warren Alquist Act was adopted.

Facilities with archaic systems and no intention of upgrade (especially with no funds available even if a retrofit) should be the highest target of energy efficiency programs for both ratepayers and in development of efficiency as a resource, since the least efficient existing systems have the greatest potential for absolute energy savings.

Use Case 2: Permitted projects that fail to meet code

The decision maker is motivated to replace equipment. The project is permitted, and what is installed fails to meet code.

Use Case 3: Unpermitted projects

As the Commissions are aware, almost ten times as many residential HVAC units imported to California as the number of permits pulled, as evidenced in the widely accepted metric that there is only a 10% permitting rate for residential HVAC projects.

[15] California Energy Commission staff, Achieving Energy Savings in California Buildings, California Energy Commission Draft Staff Report, July 2011 http://www.energy.ca.gov/2011publications/CEC-400-2011-007/CEC-400-2011-007-SD.pdf

3) *What specific information/data can you provide on the volume of deferred retrofits and retrofits that avoided code triggers or code compliance? In what types of buildings (as clarified above)? What evidence is there that these cases reflect norms of market activity rather than the exception?*

The LGSEC is not aware of a dataset that tracks building owners that are not taking action in retrofitting their properties. It is suggested that in Phase III, a cost effectiveness study be conducted that characterizes the financial benefits of energy efficiency measures ("EEMs") with code as baseline, and for the same EEMs with actual conditions as baseline. The gap between the net present value and lifecycle cost analysis for each scenario may be a telling indicator of why deferred retrofits are occurring. One additional recommendation would be to add rigor to the cost estimating elements of such a financial analysis. While there are trustworthy sources for material costs, labor rates, and equipment costs, there is a considerable amount of knowledge required by consultants to apply these figures to estimate the cost of actual projects. We urge the CPUC to work with the construction community to enhance the depth and understanding of unique conditions that accompany the retrofits that we are striving to characterize and accelerate.

4) *How do the Commission and CEC's assumptions about the rate of turnover compare with your observations of the market? Please be comprehensive and specific (like above). What evidence/ data can you provide?*

Please see the response to question 2 above. The rate of turnover is linked to DEER EUL which is "an estimate of the median number of years that the measures installed under the program are still in place and operable."[16] The actual removal of equipment is a distribution that varies widely. So when the market sees a spectrum of years for EUL, and DEER specifies one year, there will subsequently be a group of decision makers that are not optimally characterized.

[16] Energy Efficiency Policy Manual. Post 2012 Energy Efficiency Programs http://www.cpuc.ca.gov/NR/rdonlyres/7E3A4773-6D35-4D21-A7A2-9895C1E04A01/0/EEPolicyManualV5forPDF.pdf

Additional studies and primary data collection are recommended to increase the understanding of the market; moreover, there needs to be a mechanism to integrate this 'distribution' of EUL into cost-effectiveness calculations and market studies, rather than pointing to one specific number for EUL per measure.

5) *Equipment does burn out, and buildings do get retrofit, triggering code upgrades. Given this reality, coupled with the fact that federal and state Codes and Standards exist and set efficiency floors for replacement equipment and building renovations, how can the CPUC ensure that an existing conditions baseline will not provide customers incentives and credit utility programs for large amounts of savings that are already occurring anyway?*

The CPUC should either:

- Measure net to gross on a program basis, or
- Enable local governments to have sufficient energy usage data access to perform outcome-based codes, as well as measured performance based incentive programs (e.g., Open energy efficiency Meter pilot).

Because EUL has such a distribution, and because cost-effectiveness requires both a code baseline and an actual conditions study and every project carries unique costs and challenges, it may be worthwhile investigating a rule set whereby the CPUC can ensure that a transparent methodology exists to accommodate the inputs that actually characterize decision makers as they evaluate the benefits of undergoing an energy efficiency (or Integrated Demand Side Response) retrofit.

VI. CONCLUSION

The LGSEC sees the future determinations on baseline to be critical in unlocking the volume of retrofits necessary to meet the Governor's goal of doubling energy efficiency. At the least, we recommend the CPUC begin characterizing and tracking the actual market conditions

so that actual grid impact can be determined from our energy efficiency efforts. In the process of the CPUC working with local governments, utilities, and other Program Administrators in gathering data to quantify deferred retrofits, the LGSEC hopes that the results significantly inform program design to move market participants who are not already acting. In addition to enhanced program design, there is also promise for enhanced policy design at the state and local government level in outcome-based, code-complementary, performance-based incentives. A better understanding of baselines, existing conditions and EUIs using AMI data will allow us to account for real and reliable savings. Whether the incentives are below or above code is perhaps secondary to the methodology for accounting, tracking and measuring our impact for energy efficiency, distributed energy resources, and avoided greenhouse gas emissions.